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ABSTRACT

This document reviews various definitions of the nature and classification of drugs. Difficulties with existing categorizations which use such bases as clinical utility, molecular structure, effects on the central nervous system, legality, and hazard potential are disucssed. A more meaningful categorization based on the availability and sources of psychoactive drugs is offered. Categories include herbal, over the counter, prescription, unrecognized, tabacco, alcohol, and illicit drugs. Connotative meanings of the drug categories are examined in terms of the semantic differential. College student interests concerning drug categories are reported. Concerns about psychoactive drugs are mentioned. A typology of use patterns associated with motivations includes experimental, social-recreational, circumstantial-situational, intensified, and compulsive drug use. Use patterns are summarized. A traditional evaluation of use patterns reviews drug use, misuse, and abuse definitions. Finally addiction, habituation, and drug dependence are discussed. (Author/JLL)

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CATEGORIZING DRUGS AND DRUG-TAKING:

A MORE MEANINGFUL APPROACH

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> It is of fundamental importance that man has and will inevitably continue to have potentially dangerous drugs at his disposal, which he may either use properly or abuse, and that neither the availability of these drugs nor the temptation to abuse them can be eliminated. (Wald and Hutt, 1973, p. 60)

The sentiments expressed in the preceeding statement indicate a peculiar paradox. Drugs are to be found everywhere in our surrounding environment in many different forms. Many of these are drugs that we use commonly without recognizing that they are drugs. Attempting to eliminate drugs from our environment is an exercise in futility particularly in an unrecognizable form.

Many chemicals that we use can only be considered drugs within the context of their use. We may then use the same substance in a different way and not consider it a drug. Gentian violet is a dye used to stain certain tissues for microscopic examination. Yet this same substance is also used in the clinical treatment of certain types of vaginal infections.

When we begin to realize the magnitude of the number of drugs available the enormity of the situation becomes obvious. In spite of this, billions of dollars are spent annually at federal, state and local levels in an attempt to control the availability and use of certain drugs.

The phrase <u>certain drugs</u> highlights the paradox. Which of the drugs available to us should be controlled? Why should these be controlled and others not? Are we only concerned about

potential dangers of some drugs? These are only some of the questions that need clarification in an attempt to make drug use a responsible behavior and drug misuse or abuse a concern whose day has passed.

Moreover, drug use is not only a current phenomenon.

> The use of drugs to alter consciousness is nothing new. It has been a feature of human life in all places on the earth and in all ages of history. In fact,...the only people lacking a traditional intoxicant are the Eskimos, who had the misfortune to be unable to grow anything and had to wait for white men to bring alcohol (Weil, 1972, p.17)

Weil proposes that drug use may in fact be a rudiment of a human drive to alter consciousness. While this may seem on the surface a radical tact to take, it may provide one of the clearest explanations of widespread drug use. Nevertheless, drug use is here to stay and requires our attention. If not to eliminate it, then to make responsible.

Why then the whole person? Fragmented efforts result in billions spent to reduce availability, books about nervous systems or books about substances. Yet so many drugs are unrecognized and not controlled, every nervous system is attached somewhat solidly to a whole body, and a substance will not cause drug-like effects unless used by a person.

WHAT ARE DRUGS

This term drug is often times one of convenience. Substances which are medically approved for the treatment of disease are readily labeled drugs as are those substances which are obtained from a black market for recreational use. However, the connotation of the word drug in these two cases is frequently different and we look upon the users of these two types of drugs differently.

While most people will accept the term drug as a descriptor of tobacco, many will not accept the use of the term for alcohol. These difficulties are compounded when we examine the nature of some substances that we use repeatedly, yet fail to recognize their drug like properties (i.e., coffee which contains the drug caffeine).

Is there a common denominator among these substances, one that would allow us a precise definition of the term drug. In the scientific sense, a drug is any substance, other than food or water, which by its chemical nature alters the structure or functioning of an individual. This very broad definition encompasses a wide variety of substances. For this to be an effective operational definition it must be understood and accepted by a large number of people.

In a study of 1,091 families in a community in New Jersey, Stanley Einstein (1972) attempted to assess which of several definitions of the word drug was deemed most appropriate. The data in Table I reflect their responses (Einstein, 1972, p. 402):

TABLE I DRUG DEFINITIONS, BY 1091 RESPONDENTS

"The term 'drug' has been defined in many ways. Which of the following definitions do you think is most appropriate?"

	n	%
1. A drug is any substance used as a medicine or in making medicines.	128	12
2. A drug is any chemical compound used for the relief of pain or suffering	70	6
3. A drug is any narcotic substance or preparation, especially one that is habit forming	298	27
4. A drug is any substance, other than food, that by its chemical nature alters the structure or functioning of a living organism.	463	43
5. A drug is any biologically active substance used in the treatment or prevention of illness,		

Based on the responses to this questionnaire, a large number of respondents (43%) do accept the broad scientific definition as appropriate. It is interesting to note though, that 27 percent of the respondents felt that only one class of substances (narcotics) are drugs. Suffice it to say that a certain amount of confusion exists.

Within the context of the broad scientific definition, some additional statements may be added to further refine and operationalize the concept.

> All drugs act according to the same general principles. Their effects vary with dose. For each drug there is an effective dose (in terms of the desired effect), a toxic dose and a lithol dose. All drugs have multiple effects. The lower the dose, the more important non-drug factors become in determining drug effect. At high dose levels, and for some individuals at much lower dose levels, all drugs may be dangerous. The individual and social consequences of drug use escolate with frequency and duration of use. American drug policy will never be coherent until it is formed an uniform principles such as these, which apply to <u>all</u> drugs (National Commision on Marijuana and Drug Use, 1973, p. 11).

I CATEGORIZING DRUGS

Usdin and Efron (1972) have listed 1555 known psychoactive drugs, and Glenn (1974) has found that over sixty psychoactive drugs have been included in various surveys of illegal drug use. Obviously, even the specialist in psychopharmacology cannot be expected to be familiar with all 1555 drugs. Even the sixty drugs identified by Glenn as being of interest in the area of illegal drug use are too numerous to be committed readily to memory. Some sort of categorization or classification

scheme is necessary to put order into the field and to reduce its complexity to comprehensible proportions.

DIFFICULTIES WITH EXISTING CATEGORIES

In the words of Canada's Commission of Inquiry into the Non-Medical Use of Drugs (1970), "Drug classifications based on a variety of different considerations have been developed and there appears to be little agreement as to the optimal scheme for ordering the universe of biologically active substances." Since drugs can reasonably be ordered along a variety of dimensions the choice of one of these dimensions as the basis for categories is an arbitrary decision based on the background and needs of the categorizer. Existing categorizations have used such bases as clinical utility, molecular structure, effects on the central nervous system, legality and hazard potential to define categories of drugs. Each of these categorizations is well suited to particular backgrounds and purposes.

1. Clinical Utility

The earliest categorizations of drugs were those based on the therapeutic uses of the drugs. Such categories are of obvious relevance to the physician and to the patient. A typical example is the classification of psychoactive drugs used by Balter and Levine (1969). The six categories are major tranquilizers, minor tranquilizers, antidepressants, stimulants, sedatives and hypnotics.

The major tranquilizers, as categorized by Balter and Levine, are a group of drugs used primarily in the treatment of the most severe mental illnesses, the psychoses. They act to reduce or eliminate such psychotic symptoms as disordered thought processes, hallucinations, delusions and agitation. They also

relieve nausea and reduce or halt vomiting. Other effects such as drowsiness, slurred speech, impaired coordination, muscle tremors and inability to sit still are regarded as side effects in terms of this categorization because they are not therapeutically useful.

The minor tranquilizers relieve anxiety without significantly affecting alertness or coordination except at very high doses. Many of these drugs also are muscle relaxers and reduce or prevent convulsions. There are more prescriptions filled for the minor tranquilizers than for any other of these categories of psychoactive drugs. The most frequently prescribed drug of any type in the United States is Valium, a minor tranquilizer.

The antidepressants, as their name clearly indicates, are used to combat depression. This category is actually a rather loose amalgam of drugs having quite different actions within the person but sharing the ability to relieve depression without producing stimulation. Other effects vary from drug to drug.

Stimulants are used to reduce fatigue, maintain alertness, increase confidence and elevate mood. Before the development of the various antidepressants the stimulants were commonly used to relieve depression. Many of the stimulants also have powerful appetite suppressing effects. Paradoxically, many of the stimulants also have a calming effect on hyperactive children and perhaps on psychopathic adults as well.

Sedatives have a general calming effect as a result of reducing the nervous systems responsiveness. Some degree of drowsiness always accompanies the calming action. For this reason, the sedatives have largely been replaced by the minor tranquilizers in clinical use.

The hypnotics are more commonly known as sleeping pills. Although Balter and Levine (1969) place the sedatives and the hypnotics in separate categories, they are often, in fact, the same drugs. In most instances, only the dosage differentiates between the two categories - smaller doses producing sedation while larger doses result in sleep. A more common usage combines these two categories into one category of sedative - hypnotics.

A somewhat different categorization is used by the World Health Organization (W.H.O.) which recognizes five categories of psychoactive drugs. The first category, the neuroleptics correspond to the major tranquilizers as described above. The anxiolytic sedatives are a category equivalent to the minor tranquilizers. The antidepressants are a category in this scheme as in that of Balter and Levine. The psychostimulants are, of course, the same as the stimulants above. The fifth category, the psychodysleptics, does not correspond to anything in Balter and Levine's categorization. The psychodysleptics are defined as drugs which produce abnormal mental phenomena, particularly distortions of thought or perception. These drugs are more commonly known as psychedelics or hallucinogens, such as LSD25. Strangely this categorization does not include the sedative-hypnotics and neither Balter and Levine nor the W.H.O. include any of the pain relieving drugs in their categories.

Though categorization by clinical utility is clearly of value in clinical settings, there is little to recommend such a categorization for the general student of drugs. These categories are constructed as if therapy was the only use of psychoactive drugs. Other usage patterns are ignored as

irrelevant to the purposes of this categorization and effects of the drugs which are not seen as therapeutic are treated as being of lesser importance and are referred to as side-effects.

2. Central Nervous System Effects

Though the point will be made repeatedly throughout this text that no drug has a single effect nor effects solely on a single bodily system, the psychoactive drugs are used primarily for their effects on the central nervous system (CNS). The simplest categorization divides the psychoactive drugs into CNS stimulants and CNS depressants. Among drug users the same categorization is commonly used, referring to the two categories as "uppers" and "downers." The CNS stimulants are those drugs which increase the reactivity of the CNS, while the depressants decrease the reactivity of the CNS. Stimulants would thus include such drugs as the amphetamines, caffeine, marijuana, and LSD-25. Depressants would include alcohol, the barbiturates and the narcotics. Such a categorization has the virtue of simplicity and the stimulant - depressant dichotomy is often a useful concept. This categorization, however, is too broad - lumping together drugs with a wide variety of effects and usage patterns.

A more sophisticated categorization based on CNS effects has been developed by Max Fink of the State University of New York at Stony Brook. Fink (1968) has classified drugs using the electro-encephalograph (EEG), a machine which measures the electrical activity of the brain. This electrical activity fluctuates in a wave-like pattern which can be described in terms of amplitude (how tall the waves are) and of frequency (the number of waves per second). During deep sleep the EEG

records brain waves of very high amplitude and slow frequency. As the level of arousal increases the waves shift to lower amplitudes and faster frequencies. Best known of the EEG patterns are the alpha waves of high amplitude and low frequency which are characteristic of a person in a state of deep relaxation or of meditation.

Fink (1968) categorizes drugs into four classes based on EEG changes characteristic of those drugs' effects. Class I is characterized by slowing of frequencies which is associated with drowsiness, relaxation, confusion, memory loss, and reduction of any psychotic symptoms. Thorazine and the other major tranquilizers are typical Class I drugs. Class II is characterized by increased fast activity with either increased or decreased amplitude. Increased fast activity and increased amplitude is typical of such sedating drugs as the barbiturates or Valium. Increased fast activity and decreased amplitude is typical of stimulants such as the amphetamines and the psychedelics (LSD-25, mescaline, etc.). Class III is characterized by increases in both fast and slow activity with resultant confusion, thought disorder, memory defect, hallucinations, and delirium. Such drugs as belladonna and phencyclidine (the drug popularly sold on the black market as THC) are typical of Class III drugs. Class IV drugs are associated with variation in the total proportion of brain waves that are alpha waves. Typical Class IV drugs which increase alpha waves, with associated euphoria, relaxation and reduction of any psychotic symptoms, are alcohol, heroin, morphine, and methadone.

The categorization developed by Fink is certainly a highly sophisticated classification with a great deal of usefulness

for researchers. It is, however, a narrow view of drugs. As we have already pointed out every nervous system is more or less firmly attached to a person. Drugs affect more than just the nervous system and their uses and effects are determined to a significant degree by factors outside of the CNS.

3. Molecular Structure

Classification according to molecular structure is the most useful categorization of drugs for the pharmacologist or chemist. Such a categorization enables them to study the relationships between structures and actions of drugs and can facilitate research aimed at developing new drugs. Usdin and Efron (1972), for instance, categorize drugs into six broad classes with a number of subclasses to make a total of twenty-five categories.

Aside from the fact that such categories as indoles or aliphatic compounds mean little to the non-chemist, such a categorization ignores the importance of user and social factors. A drug is a chemical substance but it becomes important only when it is taken by a person. The nature of that import will be determined by the physical and mental state of the person, and the social and environmental context of the use, as well as by the molecular structure of the drug itself.

4. Legality

The legal status of drugs is obviously an important basis for categorizing drugs. In fact, much of the public seems to define only two categories of drugs - "medicine" and"narcotics". "Medicine" includes all those legally available drugs which are taken to treat illness or relieve suffering. "Narcotics" (or sometimes simply "drugs") refers to all illegal drugs

whatever their nature or effects may be. Though the term narcotic technically refers to a group of pain-relieving drugs related to opium and including morphine and heroin, it was extended by the Federal Bureau of Narcotics in 1928 to include cocaine - a drug with strikingly different effects. Over the years such diverse drugs as marijuana, LSD, methamphetamine and even airplane glue have been defined by various state and local laws and in the public consciousness as "narcotic" or "dangerous" drugs. Much of the public, as Zinberg and Robertson (1972) point out, hold to "the attitude that there is little need to differentiate among different sorts of nonmedical drugs." Medicines are good and "narcotics" are bad; that is all many people feel there is worth knowing on the subject.

One of the key elements in current regulation of the psychoactive drugs is a categorization established by the federal Comprehensive Drug Abuse Prevention and Control Act of 1971. These five categories (or schedules) are purportedly based on the potential for abuse and medical need for the various drugs. Schedule I contains those substances held to have a high potential for abuse and no recognized medical use, such as heroin, marijuana or LSD. Schedule II is made up of medically useful drugs with a high potential for abuse, such as morphine, codeine, methadone, cocaine, the amphetamines, the barbiturates and methaqualone. These drugs are available only on a physician's written prescription which cannot be refilled. Schedule III is made up of drugs with a moderate potential for abuse, such as paregoric, Empirin with codeine, Doriden, Preludin and Ritalin. Schedule IV contains

drugs with a low potential for abuse, such as phenobarbital and Miltown. Finally, Schedule V contains such drugs as codeine cough syrups which are held to have almost no abuse potential. These last three schedules are all available on a refillable prescription from a physician.

5. Hazard Potential

The classification of psychoactive drugs into categories based upon their relative potential hazards has not been widely used but has much to recommend it. The relative dangerousness of various drugs is a major concern not only to the drug user but also to physicians, educators, parents and law-makers. The very imprecise usage of the terms "hard" and "soft" drugs may be seen as a crude first approximation of such a categorization. Systematic categorization on this basis has been essentially the work of one man, Dr. Samuel Irwin, who was extensively cited earlier in this chapter.

Irwin's (1971) first publication on the subject of potential hazards was not truly a categorization but this excellent and widely-cited paper provided the basis for his later categorization. In this seminal paper eight drugs of current concern were rank-ordered according to their potential hazard to the individual and to society. In terms of hazard to the individual Irwin (1971) ranked the drugs from most hazardous to least hazardous as follows: (1) glue-sniffing, (2) methamphetamine, (3) alcohol, (4) cigarettes, (5) barbiturates, (6) heroin, (7) LSD-25, and (8) marijuana. The potential for hazard to society in terms of harm to others through social deterioration, apathy, crime, accidents, etc. ranks alcohol first as the most hazardous drug followed in order by (2) methamphetamine,

(3) barbiturates, (4) heroin, (5) marijuana, (6) LSD-25, (7) glue-sniffing, and (8) cigarettes.

In order to develop a broader and more valid base for categorizing drugs according to hazard potential, Irwin (1973 and 1974) called upon an expert panel of seven physicians and scientists to rate the hazard potential of various drugs. From rankings by the panel on seventeen scales weighted scores were derived for each drug in terms of individual and social hazard. Each of these scores was expressed as a percentage of the maximum possible hazard score. The ratio of individual hazard score to social hazard score is used as an I/S score to assign the drugs to categories ranging from very high hazard to very low hazard with maximum chronic use. These categories are illustrated in table 3.

TABLE 3

Drug Hazard Categories*

adapted from Irwin (1974)

Hazard Category	Drugs	I/S
Very High	Alcohol	
	Distilled Spirits	81/79
	Wines	77/79
	Seconal	65/83
	Methamphetamine	63/69
	Cocaine	61/69
High	Food	53/16
	Valium	42/69
	Delta 9-THC	40/55
	Hashish	39/50
Intermediate	Heroin	48/47
	Methadone	40/44
	Cigarettes	37/0
	LSD-25	31/41
	Opium	28/40
	Beer	27/42

Table 3 Continued

Hazard Category	Drugs	I/S
Low	Librium	21/37
	Marijuana	25/29
	Caffeine	23/22
Very Low	Cigars	13/0
	Coffee	10/9

*Hazard with maximum chronic use

It is possible to argue with various specific points in Dr. Irwin's schema, such as placing beer in one category while wine and distilled spirits are placed in another, but the categories do have merit in that they take a very broad look at the effects of drugs. This is more nearly a "whole person" approach which emphasizes drug effects without giving adequate recognition to the individual and social determinants of drug use patterns (not that Irwin disregards such aspects elsewhere in the papers cited).

Such a categorization also suffers from its negative orientation. A systematic view of drug hazards is of considerable practical value to all who are concerned with drug use, misuse and abuse. Such a view, however, is probably not the best perspective from which to approach the general study of drugs. Patterns of drug use are likely to be far more affected by laws, social expectations and sources of supply than by the individual and social hazards of use, particularly since the true hazards are so commonly misperceived.

CATEGORIZING DRUGS IN A MORE MEANINGFUL WAY

We feel that a more meaningful categorization could be

based on the availability and sources of psychoactive drugs. Such a categorization would incorporate legal categories along with other relevant social categories. It would reflect commonalities in the usage patterns of drugs grouped together and differences in usage patterns between categories. Such a categorization would also seem to reflect societal norms and public attitudes more accurately than the preceeding categorizations.

The categorization we will use is a modification of categories proposed by Mark Miller (unpublished). Miller developed his categorization in the course of his work as Director of the Drug Information Center of the University of Oregon. We have renamed one of Miller's five categories and separated out our society's two most widely used, misused and abused drugs as categories by themselves.

The Herbal Drugs are plant substances which have drug effects and whose use is not generally regulated by law. These substances generally require little or no processing after gathering the plants. Though they may be processed and sold commercially it is usually possible for the user to prepare the drug for his or her own use if it can be grown locally. Such drugs as nutmeg, catnip, mandrake and fly agaric are herbal drugs.

Over the Counter Drugs are commercially produced drugs which may be purchased legally without a prescription. These drugs are also known as proprietary drugs.

The Prescription Drugs are commercially produced drugs which can only be legally sold or dispensed by a physician or on a physician's prescription. They are like the over the counter drugs in that they are manufactured by pharmaceutical

companies but differ in that the decision to use these drugs is legally vested in a licensed physician rather than in the user. Examples of this category would include Benzedrine, Seconal, Valium, Thorazine and Morphine.

The Unrecognized Drugs are commercial products which have psychoactive drug effects but which are not generally thought of as drugs. These substances are not generally regulated by law except insofar as standards of sanitation and purity are required. Coffee, tea, cola drinks, and cocoa are examples. Many glues, solvents and spray can propellants may also be regarded as unrecognized drugs.

Tobacco is not generally thought of as a drug and thus could be classed as one of the unrecognized drugs. Tobacco, however, holds such a distinct position in terms of usage patterns, economic importance and health consequences that it seems to merit a category to itself. It, of course, takes a variety of forms - cigarettes, cigars, pipe tobacco, chewing tobacco and snuff.

Alcohol also seems to merit its own category although it could be included in the unrecognized drugs. Alcohol, in such forms as beer, wine and distilled liquor, is one of the most widely used drugs in our society. It is also regarded by many experts as the most commonly abused drug in our society.

When the word "drug" is used in our society it most often seems to refer to the category we call Illicit Drugs. These are the drugs whose sale, purchase or use is prohibited by law or custom. Criminal penalties usually are applicable to violators of these laws.

CONNOTATIVE MEANINGS OF THE DRUG CATEGORIES

In the preceeding section we have defined seven drug

categories. Like the definitions in a dictionary these definitions deal with one facet of meaning - denotation. Denotation concerns an objective description of the objects to which the term refers. In addition to denotation, there is connotation, that is, the implications the term has for the person who uses it.

In order to examine the connotative meanings of words or concepts, Osgood, Suci and Tannenbaum (1957) developed an instrument known as the semantic differential. The semantic differential is composed of a collection of scales each anchored on two adjectives which express extremes of meaning such as hot and cold or wet and dry. Factor analysis of semantic differential ratings of a variety of concepts led Osgood, et al. to identify three dimensions of connotative meaning. The strongest of these dimensions is evaluation, which is defined by such pairs of adjectives as good - bad, clean - dirty and valuable - worthless. On this dimension a score of seven would indicate that the concept being rated was very good, very clean or very valuable, while a score of one would rate the concept as very bad, very dirty or very worthless. On any of the scales a score of four represents a neutral rating - neither good nor bad, etc.

The second strongest dimension that frequently appears in factor analyses of semantic differential scales is potency. Some pairs of adjectives relating to that dimension are strong - weak, heavy - light and hard - soft. Scores greater than four represent the strong, heavy and hard end of the scale.

Activity is the third of these dimensions. Some of the pairs of adjectives which load on that dimension are active - passive, tense - relaxed and fast - slow. Active, tense or

fast ratings are represented by scores greater than four.

A fourth dimension identified by Nunnally (1961) is understandability (or predictability as we prefer to term it) which is related to such adjective pairs as predictable - unpredictable, understandable - mysterious and familiar - unfamiliar. A score over four would represent a rating of a concept as predictable, understandable or familiar.

Sixty-eight teacher education students, including both elementary and secondary education students, were asked to rate each of the seven categories of drugs on a semantic differential composed of three scales measuring each of the four dimensions we have described. Each of the drug categories was defined as they are in this book before being rated on the semantic differential.

Average ratings on each of the four dimensions were calculated for each drug. The highest rating on the evaluation dimension was given to the prescription drugs and the lowest rating was given to tobacco. On the activity dimension the illicit drugs were ranked highest and the herbal drugs lowest. Illicit drugs were rated most potent and herbal drugs least potent. In terms of predictability alcohol ranked first and the illicit drugs last.

Table 4 summarizes the results of this study by identifying each drug's position on each dimension by an adjective representative of that end of the scale the average rating is closest too. Many of the ratings actually are very near to the neutral rating of four. The unrecognized drugs, for instance, are given nearly neutral ratings on all four dimensions.

It is possible then to discount the nearly neutral ratings and describe each drug category's connotative meaning in terms

of only the significant ratings. In this manner the herbal drugs can be described as simply having the connotation of goodness. The over-the-counter drugs can be described as predictable and good. The prescription drugs are good and predictable. The unrecognized drugs are simply neutral on all dimensions. Tobacco is bad and predictable. Alcohol is predictable. The illicit drugs are bad, unpredictable and strong. It should be noted, however that predictability may really mean only familiarity.

COLLEGE STUDENT INTERESTS CONCERNING DRUG CATEGORIES

A final concern regarding the categorization of drugs we have proposed is whether or not it represents areas of real concern to potential readers of such a book as this. In order to examine this concern, a questionnaire was administered to all students enrolled in a mixed graduate and undergraduate course on drug use and abuse. Students were asked to list questions they believed their fellow students would like to have answered about drugs. Of 126 students present at that class period, 86 students returned questionnaires.

A total of 541 questions were listed by the students surveyed. Rankings of the seven drug categories by the number of questions asked about each are shown in Table 5. Greatest interest was expressed concerning the herbal drugs (108 questions) and the illicit drugs (103 questions). The smallest number of questions were asked about alcohol (55 questions) and the prescription drugs (59 questions).

Table 5 also shows rankings of the drug categories by the number of questions asked in each of three major groups of questions. The largest of these groups was composed of 188

questions about the effects of drugs. The next group consited of 82 questions concerning drug hazards and the third group was composed of 79 questions about the regulation of drugs. The drug category whose effects were of greatest interest were the herbal drugs while the smallest number of effects questions were asked about the prescription drugs. The largest number of questions regarding hazards were asked about tobacco and the smallest number about the prescription drugs. The greatest interest in regulation of drugs was expressed about the illicit drugs and the least about alcohol.

It can thus be seen that there is a significant student interest in each of the seven categories. It can also be seen that the different drug categories present different patterns of student interest. The proposed categorization, then, is reasonably related to student interest regarding drugs and seems to provide a sound basis for the general study of drugs in relation to the whole person.

TABLE 4

Connotative Meanings of Drug Categories

	Dimensions			
Drug Category	Evaluation	Activity	Potency	Predictability
Herbal	Good	Passive	Weak	Predictable
Over the Counter	Good	Active	Strong	Predictable
Prescription	Good	Active	Strong	Predictable
Unrecognized	Bad	Active	Weak	Unpredictable
Tobacco	Bad	Active	Strong	Predictable
Alcohol	Bad	Passive	Strong	Predictable
Illicit	Bad	Active	Strong	Unpredictable

TABLE 5

Drug Categories Ranked by Student Interst

Drug Category	Total	Questions Effects	Groups Hazards	Regulation
Herbal	1	1	5	3
Over the Counter	3	3	6	2
Prescription	6	7	7	5.5
Unrecognized	5	4	2	4
Tobacco	4	6	1	5.5
Alcohol	7	5	4	7
Illicit	2	2	3	1

II. CATEGORIZING DRUG USE

WHAT ARE SOME CONCERNS WITH PSYCHOACTIVE DRUGS

Any discussion about drugs with respect to the whole person must sooner or later focus on the individual and his or her role in society. Drug use almost always implies some degree of social risk (National Commission On Marijuana and Drug Abuse, 1973, p. 93) for an individual and it is that degree of risk that lies at the heart of the concerns with psychoactive drugs.

Psychoactive drugs work by interacting with biological organisms. In humans this interaction is precipitated by use of the drug. The National Commission on Marijuana and Drug Abuse describes in its second report (1973, pp. 93-94) that risk-taking and risk-producing behavior provide the primary concerns associated with drug use.

> The assignment of risk to patterns of drug-using behavior is necessarily complex and derives from a consideration of the individual, the pharmacolgic

> properties of the drugs, the frequency, intensity and duration of use, dosage levels, motivations for use, social and legal conditions, and a wide range of other factors. However, a backward glance over the many years of public concern over durg-using behavior, expressed in laws, pronouncements and programs, indicates a failure to distinguish the patterns of drug using behavior as part of the process of assigning risk.

A variety of types of risk are described in the commission's report that warrant some revi w here. Acute reactions to drugs, overdose and psychological trauma can be described as risks to the individual. The need to establish and maintain services to prevent, control or treat such conditions involves public health planning.

When drug taking behavior interferes with social functioning, the individual is again at risk. If these consequences are severe enough this risk is extended to society. When drug taking results in alterations of perception, judgement or loss of control over behavior, the individual is at risk but public safety is affected as well.

These are just a cross section of the potential risks associated with drug taking behavior. The potential for risk is often categorized by describing major types of drug taking behaviors. What follows are several different typologies of drug using behavior.

A TYPOLOGY OF USE PATTERNS ASSOCIATED WITH MOTIVATIONS

This typology of drug use was developed by the National Commission on Marijuana and Drug Abuse in its second report (1973). It is based upon observations of both youth and adult populations, and the inherent risks are subsumed under the definitions of each of the categories. It is an attempt to derive descriptions of each of use patterns consistent with the

individual's motivations, and therefore an appropriate typology within the context of the whole person.

Drug usage here is not described in terms of isolated behavior patterns, nor is the typology dependent upon drug categorization. Drug use descriptors that are dependent upon drug classification or categorization are inherently complicating and dysfunctional. They neglect the concept that indicidual's may use different drugs for similar reasons. It must also at this time be stated that acute reactions to any drug can occur regardless of use patterns and that may categorization does not imply that one pattern of use is or may be safer than any other.

1. Experimental Use

Experimental use implies short term use of one or a variety of drugs either singly or in combination. Curiosity or a desire to experience something new provides the major motivations for experimental drug use. Experimental use is usually limited to ten experiences with any single drug.

Use patterns of the experimental type usually carry with it relatively low risk potential. This does not mean however, that acute or even fatal reactions cannot occur, although the frequency of such reactions is relatively small.

A question arises with respect to experimental drug use. What is it that causes some people to continue using a particular drug and others to discontinue such use. The LeDain Commission, in their final report to the Canadian government (Commission of Inquiry Into The Non-Medical Use of Drugs, 1973, p. 708) indicate that

> Experimental users of a drug are those persons who have not yet learned to effectively use and positively interpret the effects of the drug in question. They usually have no regular access to supplies of the substance, and they are unlikely to have assumed the definitions and evaluations of the using culture. Persons who try a drug but never learn to recognize or appreciate its psychotropic effects are unlikely to advance to occasional use of the drug. They will, instead, terminate their use after a few experimental sessions.

Here we see that it is the value of the initial experiences as interpreted by the individual user within the context of needs expectations and motivations that provide the impetus for continued use. Positive experiences, or pleasant 'highs' are often learned experiences, and not always inherent with use of a particular substance. Certainly tobacco provides a clear example of this process. Few people would claim that initial inhalation of tobacco smoke is a pleasurable experience. In fact, many people have a great deal of difficulty in physically achieving deep inhalation of the smoke initially. But, given strong enough motivations, a receptive social milieu and an ability to learn to like the experience and the individual may continue.

2. Social-Recreational Use

Very much similar to experimental use, social-recreational use of drugs occurs within social settings and is motivated by a desire to share pleasurable experiences among friends. Though this type of use tends not to escolate to other types of use it does tend to be more patterned than experimental use.

Here the individual has had initially positive experiences and sees continued use as fitting into a social context. The degree of risk associated with social-recreational use tends

to be low, but again with the same caveat as that for experimental use - that acute, even fatal, reactions can occur.

In this type of setting, actual drug use may occur for a variety of reasons. The Final Report of the Commission of Enquiry Into the Non-Medical Use of Drugs (1973) indicates at least three motivating factors: 1) to attain some degree of euphoria; 2) for increased enjoyment of other activities; and 3) as a social lubricant. Though there is some solitary recreational use of drugs, the overwhelming majority of this type of use remains social.

3. Circumstantial-Situational Use

In much the same way that people display similar behavior patterns in recurring situations, drug use of this type may be viewed as a coping mechanism. The athlete who needs to get "up" for a game or the student who must stay awake to cram for an examination are example of circumstantial-situational drug use.

Just as the experimental user must learn to "enjoy" a drug experience to continue, the drug user here must experience some degree of satisfaction with this coping mechanism, some feeling that it works before this type of use will continue. The patterns and intensity of use here is quite variable and situationally oriented. Moreover, the degree of potential risk to the individual and society is also a function of the types of situations and the nature of the drug used.

4. Intensified Drug Use

Intensified drug use implies the regular, long term consumption of a drug or series of drugs by an individual to "achieve relief from a persistent problem or stressful situation

or his desire to maintain a certain self-prescribed level of performance" (National Commission on Marijuana and Drug Abuse, 1973, p. 97.) This type of drug use implies ready availability of a drug or several drugs which may be a limiting factor for some people.

Although these individuals remain integrated in society, some dependence is evident and drug use becomes a regular daily behavior pattern.

5. Compulsive Drug Use

Compulsive drug use is characterized by diminished social integration and functioning. Here drug use has escolated to the point where a reduction in the intensity or frequency will be accompanied by increasing discomfort on the part of the individual. Drug use of this type is not a function of social setting, rather, social interaction is frequently governed by the need to get a particular drug and/or consume a particular drug.

The motivation for continued use of a particular drug within the context of compulsive use is more often than not the drive to prevent discomfort, rather than to experience something pleasurable. Although this reflects a pattern of loss of control over drug use, many individuals during early stages of compulsive use do not recognize this and feel comfortable with the thought that control over use is still a reality.

SUMMARY OF USE PATTERNS

A summary of these use patterns is necessary to prevent misinterpretations of the intent of developing a typology of use patterns. One point that is not intuitively clear and that

must be stressed is that specific drugs of any kind are not limited to any particular use pattern. As easily as some would see alcohol or marijuana fitting into the social-recreational context, so must it be said that heroin does as well. While the number of recreational users of heroin is certainly not as large as the number of people who use alcohol recreationally, the fact remains that there are recreational users of heroin.

The Final Report of the Commission of Inquiry Into The Non-Medical Use of Drugs (1973, p. 720) offers some insight into the kinds of social factors that help determine the nature of drug use.

1. Information: friends and relatives may offer information on situations ir which certain substances may be used for specific purposes.

2. Example: the occasional user may learn by watching the behavior of his peers what sorts of situation are appropriate for certain kinds of drug use, and what levels of use can be deemed excessive.

3. Ideology: participation in drug-using groups provides supporting ideologies which neutralize some of the negative opinions and attitudes surrounding illicit drug use and provide positive reinforcement and justification for drug taking behavior.

4. Opportunity: the more people in the environment who use drugs on a regular basis, the more likely it is that opportunities to use will arise at times when the individual may not otherwise have thought of consuming a drug, and that he will discover more sources of supply of illicit drugs.

TRADITIONAL EVALUATION OF USE PATTERNS

One of the greatest difficulties to deal with on a policy level is the evaluation of use patterns. What constitutes use, misuse or abuse of drugs? A variety of definitions and detriments are available, however, consensus among "experts"

is difficult if not impossible to achieve. What follows is a brief overview of some of the more common definitions of these terms.

1. Drug Use

Dr. Samuel Irwin (1973), professor of psychopharmacology at the University of Oregon Medical School, suggests that drug use "results when the sought for effects of a drug are realized with minimal hazard, whether or not used therapeutically, legally or prescribed by a physician". This would appear to be a rather far reaching definition and note that it is not drug specific. The key concept here relates to results rather than drug related variables such as dose level or frequency of use. In light of this definition it should be kept in mind that all drugs have multiple effects and we may reasonably ask - at the dose level of a drug that produces the sought after effects, what other effects also occur? If those other effects are minimal, and all effects produce minimal potential for risk to the individual and/or society, then we are describing drug use.

Noteworthy here is the fact that Irwin doesn't feel that drug use only occurs within therapeutic confines, but may also occur in a recreational or social setting (e.g., marijuana). In other definitions one may find for drug use, this would not be the case. Suffice it to say that Irwin's definition is not the only one, but perhaps the most realistic.

2. Drug Misuse

Irwin (1973) differentiates drug misuse from use by adding the disclaimer that misuse occurs when a drug is taken in situations that significantly escalate the hazard potential

for either the individual or society. It should be clear that Irwin's definitions relate to the results of the interaction between drug and individual rather than to abstract concepts such as morabity and law.

3. Drug Abuse

It is here that perhaps the greatest divergence of opinions occurs among the "experts". Lennard et. al (1971, p. 11) indicate that drug abuse has traditionally been tied to physiological, psychological or social impairment as a result of "non-medical" use of drugs. Cohen (1969, p. 10) concurs essentially, but adds the concepts of a dependence and social or cultural disapproval. Jaffe (1970) agrees with Cohen's medical-social-cultural criteria. Szasz (1975, p. 8) interprets Jaffe to mean that drug abuse then is a "disease whose diagnosis and treatment are the legitimate concern of the physician. Nowlis (1972, p. 8) raises an interesting issue however, that requires attention.

> Abuse of society's controls of drugs is not to be equated with the abuse of oneself with drugs. To assume that having labeled both as abuse makes them the same leads - only to the confusion and nonproductive response that presently exists.

Szasz (1975) agrees that this is a prohibitive definition in terms of usefulness. It is again Irwin (1973) who offers perhaps the most defensible definition in

> "Drug abuse follows when a drug is taken (sporadically, repeatedly or compulsively) to such degree as to greatly increase the hazard or impair the ability of the individual to adequately function or cope with his circumstances.

Here again Irwin relates the definition to a consequence rather than an abstract criterion. In summary though, Wilson (1968, p. 144) provides some critical insight by suggesting

that the significance of drug abuse needs to be related to two issues: 1) the relationship between drugs and individuals; and 2) the relationship between drug abuse and society. The former implies the interaction of pharmacologic properties of drugs and rather complex organisms (e.g. human beings) while the latter involves the relationships between individuals and the complex network of interlocking forces we call society. In either case, the relationship is not simple, easily definable or easily interpretable.

SOME OTHER IMPORTANT TERMS

The number of terms that are commonly used to describe different aspects of the drug abuse phenomena is quite large. Some of the terms used are quite value laden, emotionally oriented or very imprecise. One of the greatest difficulties with the use of such words occurs when people believe that there is some consensus of meaning when there really is not. Several of these terms were originally lay terms, later adopted by professionals.

1. Addiction and Habituation

As the term addiction evolved from its original latin form it began to broaden in scope until by the 16th century it implied to give up or apply habitually to a practice. The term was not used in America to describe a drug related phenomena until the 1920's when

> the scientific community had given the term addiction its blessing, a development paralleling the popularization of the word narcotics and the entry of government into the field. Narcotic addiction became a household word (National Commission on Marijuana and Drug Abuse, 1973, p. 121).

At that time, partly as a result of the direct efforts of the Federal Bureau of Narcotics, the term narcotic lost its true meaning and became associated with any drug used by undesirables. Coincidentally, the term addiction became the catchword to describe the compulsive or regular use of any drug.

It was not long before some professionals recognized that the chronic users of some different types of drugs could not easily be classified by only one behavioral descriptor. It became necessary to develop appropriate terminology in which some differentiation could be made to more adequately describe compulsive drug taking behaviors related to different drugs. Out of this grew the term habituation to describe compulsive use of drugs not associated with physical discomfort during abstinence.

Still, the two terms remained fairly imprecise until the Expert Committee on Addiction Producing Drugs of the World Health Organization (1957) produced the following comparisons.

TABLE II: COMPARISON OF ADDICTION AND HABITUATION

Drug Addiction	Drug Habituation
Drug addiction is a state of periodic or chronic intoxication produced by the repeated consumption of a drug (natural or synthetic). Its characteristics are:	Drug Habituation (habit) is a condition resulting from the repeated consumption of a drug. Its characteristics include:
1. An overpowering desire or need (compulsion) to continue taking the drug and obtain it by any means.	1. A desire (but not a compulsion to continue taking the drug for the sense of improved well-being it engenders.
2. a tendency to increase dose.	2. little or no tendency to increase dose.
3. a psychic (psychological) and generally a physical dependence on the drug.	3. some degree of psychic dependence on the effect of the drug but absence of physical dependence and hence of abstinance syndrome.
4. a detrimental effect on the individual and on society	

4. detrimental effects, if any, primarily on the individual.

Despite the precision with which W.H.O. tried to define the terms addiction and habituation, they continued to be used interchangeably by the scientific and lay community. As a result, several W.H.O. expert committees began working on new terms to more adequately describe complex behavior patterns.

2. Drug Dependence

In 1965, W.H.O. recommended that the term drug dependence be substituted for both addiction and habituation. The definition of drug dependence is as follows

> Drug dependence in a state of psychic or physical dependence, or both, on a drug, arising in a person following administration of that drug on a periodic or continuous basis. The characteristics of such a state will vary with the agent involved, and these characteristics must always be made clear by designating the particular type of drug dependence in each specific case; for example, drug dependence of morphine type, of barbiturate type, of amphetamine type, etc. (Eddy, et al., 1965, p. 732).

This W.H.O. definition for drug dependence reintroduces the terms physical and psychic dependence. One should remember that these terms were also part of the discarded concepts of addiction and habituation. It seems comewhat odd that a differentiation need again be made between psychic and physical dependence since both have biochemical origins.

In spite of this, physical dependence and psychic depencence have been differentiated in the following manner. Physical dependence results when a drug has been used for a long period of time and results in a characteristic abstinence syndrome when use is discontinued. The sincerity of the discomfort during abstinence is a function of the frequency and duration of use of

the drug. The syndrome itself may be precipitated by complete discontinuances of the drug or by ingestion of insufficient doses.

Psychic dependence describes a desire or craving to achieve the effects produceable by a drug. This desire or craving may be so strong as to lead the user to continually ingest the drug, and the drug induced state is the preferred one. Psychic and physical dependence may or may not occur together or independently.

The new definition requires that each drug has associated with it a particular type of dependence as in drug dependence of the cocaine type or drug dependence of the barbiturate type. This was done to indicate the difficulty in factoring out precise commonalities among the different dependency syndromes. At least one author (Goode, 1972) feels that this confuses the situation more than it clarifies it. Goode states (1972, p. 25)

> The basic fallacy of the World Health Organization's new terminology is its reductionism - that is, its assumption that the biochemical properties of a drug determine the behavioral reality in relation to that drug. If the old definition of addiction is understood as a strictly biochemical description, then it contains some validity, although with serious flaws. But the new terminology is completely invalid, because it is trying to deal with the social dimension by absorbing, distorting, and underplaying what is in fact the control feature of drug taking.

The primary difficulty then with the new terminology stems from the fact that it is still drug oriented. Rather than considering drug taking behavior as the complex interaction of a drug (or series of drugs) with an individual in a social environment it implies that dependence is a function and result of the drugs effects.

Somce problems may also be experienced in describing poly-drug dependence. If a person is dependent on heroin and barbiturates, do they exhibit drug dependence of the heroin

type and drug dependence of the barbiturate type, or drug dependence of the heroin and barbiturate types? The American Psychiatric Association, in their Diagnostic and Statistical Manual of Mental Disorders (1968, p. 46) list the following types of drug dependence:

1. drug dependence, synthetic analgesies with morphine like effects
2. drug dependence, barbiturates
3. drug dependence, other hypnotics and sedatives or "tranquilizers"
4. drug dependence, cocaine
5. drug dependence, Cannabis sativa (hashish, marijuana)
6. drug dependence, other psycho-stimulants (amphetamines, etc.)
7. drug dependence, hallucinogens
8. other drug dependence
9. unspecified drug dependence.

At the bottom line, the term drug dependence and its attending modifiers are an attempt at clarifying some very complex issues. While some inconsistencies exist, it may well represent a step in the right direction.

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